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Pattern of Growth of Output in Relation to Employment across the States in India

Abstract

The present paper analyses the relation between the growth of output and the growth of employment across the 21 major states in India during the post-reform period. The growth rate of output significantly increased during the post-reform period in India but not the growth rate of employment. Average productivity of labour and per capita gross domestic product shown the upward trend while they were diverging from each other. But the growth of employment has been misleading. The nature of growth across states in India is analysed in terms of output elasticity of employment. The growth was 'jobless'in 20 states and 'more job' providing in only one state during 1993-94 to 2004-05. The employment scenario deteriorated thereafter and 'job loss' growth was observed in 3 states and 'jobless' in 18 states during 2004-05 to 2011-12. A number of states have observed 'more job' growth in the agriculture and industry sectors, while the service sector witnessed'jobless growth' in the all states of India. The panel data analysis revels that the growth rate of employment is positively related with the growth rate of output and negatively related with the growth rate of labour productivity. The study finds that the growth of labour productivity adversely affects the growth of employment in India.

***Key Words*:** Growth, productivity, employment, economic reforms, job loss

JEL Classification: E23, J21, J24

1. Introduction

During the liberalized era, the Indian economy has experienced a growth of almost 244 percent in the real Gross Domestic Product (GDP) between 1993-94 and 2011-12, and the per capita real GDP increased by almost 150 per cent over the same period. But employment has increased only 26.4 percent during this period. From the theoretical reasoning it is argued that a rise in the rate of growth of output unless accompanied by a still greater rise in the rate of growth of labour productivity will necessarily raise the rate of growth of employment (Kaldor, 1966).

But the growth of employment in India is substantially low in relation to growth of output. The economic growth leads to the structural changes in the Indian economy. But the structural change is magnificent in the output front, not in the employment sphere.

The dualism in the labour market is being further sharpened in India after liberalization. Employment prospects are thus getting brightened up for the more qualified while a squeezing scenario sets in for the untrained (Chadha, 2001).

Theoretical relationship among the Growth rates of Output, Productivity and Employment

For fixed coefficients (FC) which change over time through technological progress, and no deficiency of aggregate demand (ND) (with capacity rather than labour availability being the constraining factor for output), then the rate of growth of employment is determined by the difference between the rate of growth of output (which depends upon the savings and capital-output ratios) and the rate of growth of labour productivity (which depends on the pace of technical progress) (Patnaik 2011). Here, a rise in the rate of growth of output (G), unless accompanied by a still greater rise in the rate of growth of labour productivity (G_{lp}), will necessarily raise the rate of growth of employment (G_e) (Kaldor 1966). That is

$$\boldsymbol{G_e = f\,(G - G_{lp}),\ f' > 0,}$$

Here, $G = (Y_t - Y_{t-1})/Y_{t-1} = S/C$, (s = propensity to save and c = capital-output ratio)

G_{lp}= Growth of Labour Productivity = f_l *(Technological Progress), and* $f_l' > 0$.

$$\boldsymbol{G_e \geq 0,\ if\ G \geq G_{lp}}$$

If we take the Kaldor-Verdoorn formulation (Kaldor 1966) of the rate of growth of labour productivity being a function of the rate of growth of output, say

$$\boldsymbol{G_{lp} = a + bG}$$

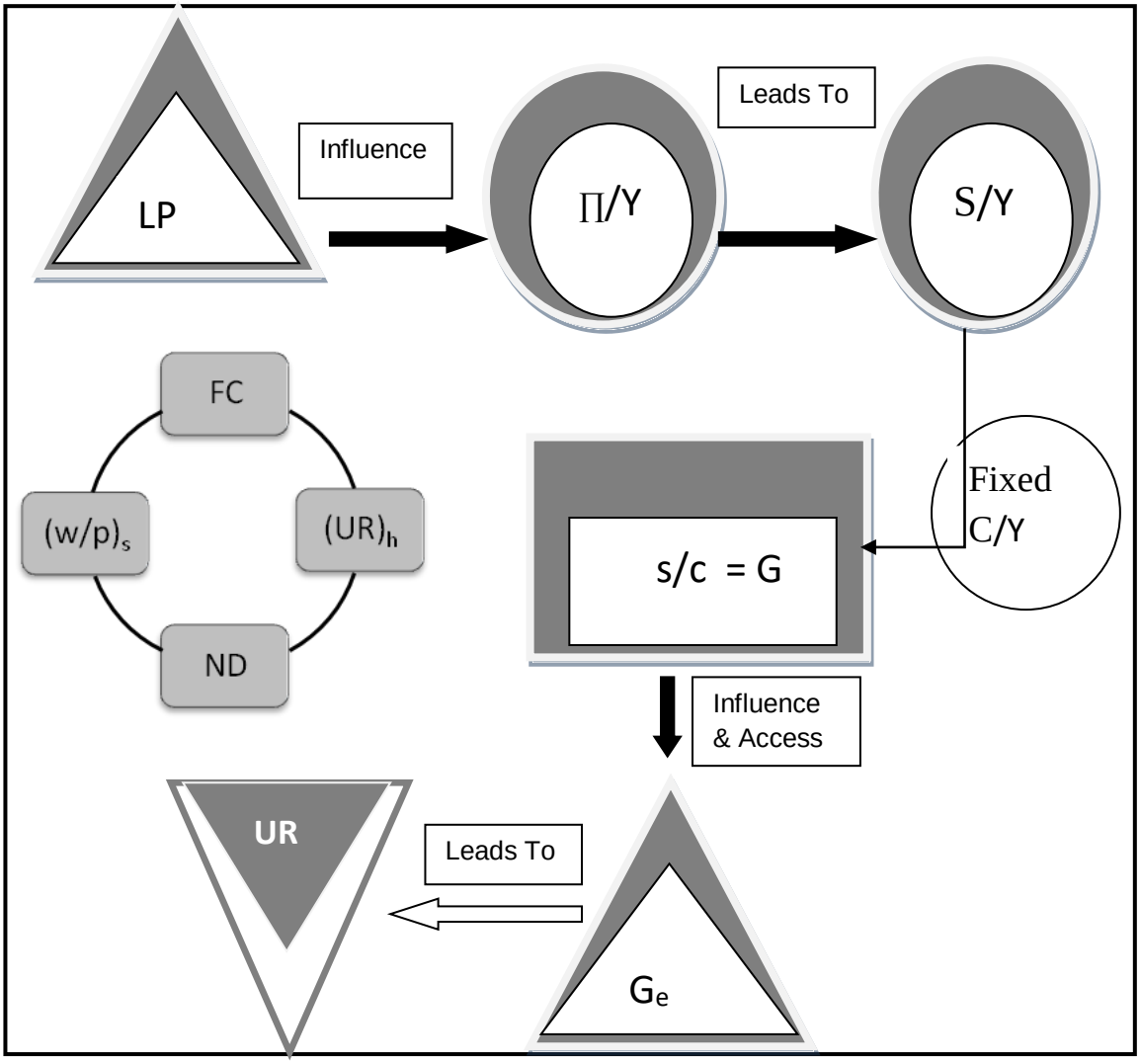
Then the rate of growth of employment *Ge* which simply equals G-G_{lp}, becomes an exclusive function of the rate of growth of output, i. e.,

$$\boldsymbol{G_e = G - G_{lp} = -\,a + (1 - b)\,G}$$

And with b<1, any rise in the growth rate of output (*G*) raises the rate of growth of employment (G_e).

When this perception is put together with another perception, namely that in a situation where the unemployment rate is very high ($(UR)_h$), real wages remain tied to a certain subsistence level ($(W/P)_s$), so that all gains in the labour productivity (LP) accrue to the capitalists, the share of surplus in output ($\prod/Y$) rises, and with it the savings ratio (S/Y) in the economy. The rise in the savings ratio, since the capital-output ratio (C/Y) can be taken to be a constant, raises the growth rate (G = s/c). This, in turn, as we have just seen, raises the rate of growth of employment (G_e). If the rate of growth of the workforce is given, this must eventually lower the unemployment rate (UR). The typical relationship is depicted in Figure 1.

Figure 1 A Typical Relation among Labour Productivity, Economic Growth and Growth of Employment



Source: Das (2014).

Review of Existing Literature

Aggarwal and Kumar (2012) found that the Indian economy has recorded substantial improvement in its GDP growth performance over the past three decades with average rates of growth going up and fluctuations coming down. Dynamic sectoral distribution has been accompanied by the economic growth in particular services with high productivity. However, the changing sectoral distribution of GDP has not been matched by the change in the distribution pattern of the labour force, as the agriculture along with other low productivity sectors continue to dominate employment. Significantly, India's pattern of growth has not been characterised by a change in the structure of employment towards manufacturing, as the share of this sector in total employment is stagnating, and recently declining, despite growth of output. Even within this sector, the resource and labour intensive low technology sectors remain the largest employers.

Choi (2007) examined the employment effect of economic growth with a labour market model. He found the structural determinants of employment elasticity and showed that the elasticity is determined by the preference and technology parameters. He also emphasized on the point that the labour-saving technology is not the only factor responsible for the slow increase in employment. He found that the elasticity of labour supply with respect to wage is an important determinant of the effect of employment on economic growth.

Basu and Das (2016) analysed a comparison between the job less growth in India and United States through the lens of employment elasticity, the responsiveness of employment to output growth. He decomposed the level and change of aggregate employment elasticity in terms of sectoral elasticity, relative growth and employment share. Thus, they performed an investigation on declining employment elasticity in India.

Dev (2004) examined the productivity performance of Indian manufacturing under varying trade regimes. He divided the overall period from 1980 to 2000 into the four sub-periods to reflect the shifts in the trade policy regime. He observed that there was no change in total factor productivity growth (TFPG) after liberalization as in the 1980s factor accumulation rather than productivity growth accounts for most of the output growth during this period.

Das (2007) analyzed that the role manufacturing output growth has had on overall economic growth and on employment growth in manufacturing industries in India in the pre-and post-deregulation phases of the country.

Das (2014) investigated that the interrelationship among growth, productivity and employment in India. His empirical results contradicted with the argument of Patnaik (2011) and established the conformity of the interrelationship among growth of output, employment

and productivity. The study found that the growth of labour productivity adversely affected the growth of employment in India.

Das and Pandit (2016) investigated that the interrelationship between growth of output and growth of employment in West Bengal. Growth rate of output has been significantly increased during the post-reform period in West Bengal but not the growth rate of employment. In panel data investigation the study finds that the growth rate of employment is positively affected by growth rate of output and inversely affected by growth rate of labour productivity. The growth of labour productivity also adversely affects the employment elasticity of output in West Bengal.

Hull (2009) pointed out that growth in one sector of the economy will not automatically translate into benefits for the poor: much will depend on the profile of growth (its employment - or productivity - intensity), the sectoral location of the poor, and the extent of mobility across sectors. He claimed that for employment-intensive growth shall translate into poverty reduction only in a "more productive" sector, while "less productive" sectors may require productivity-intensive growth to ensure a decline in headcount poverty.

Nagaraj (2004) analyzed about 15 per cent of work force in the organized manufacturing sector lost their jobs between 1995-96 and 2000-01. He briefly described the broad dimensions of the job losses, explored possible reasons for it, and suggested its implications for the labour market reforms.

Nordhaus (2005) investigated the relationship between growth of employment and productivity growth. He found that the relevant elasticities indicated that more rapid productivity growth lead to increased employment in manufacturing sector. The results suggested that productivity is not to be feared at least not in manufacturing, where the largest recent employment declines have occurred. Higher productivity has the capability to lower prices, expanding demand, and to higher employment, but the partial effects of rapid domestic productivity growth have been more than offset by more rapid productivity growth and price declines from foreign competitors.

Nagaraj (2011) raised a question about Goldar's argument and argued that the rapid growth in employment in the organised manufacturing sector between 2003-04 and 2008-09 can be explained by labour the reforms at the state level did not stand up to close statistical scrutiny. Employment growth did accelerate but when viewed over a longer period the accretion as yet remains small.

Patnaik (2011) pointed out that when an economy experiences a higher growth rate in the capitalist segment, is saddled with an increasing unemployment rate, goes against the grain of conventional growth theory as indeed of the basic presumption underlying policymaking. As for India's, instance, which faces growing misery in the midst of accelerating growth, the standard response has been such that "exclusion" will disappear if the growth rate can be further accelerated. The proposition that an acceleration of the growth rate in the capitalist segment will be accompanied by an increase in unemployment in the economy as a whole.

In this brief background the present paper analyses the trends of growth of output, labour productivity and employment and examined their relationship during the post reforms period across the major states in India.

The Data

The study is based on National Sample Survey Organisation (NSSO) data of three points of time during post-reform years- 50th round (1993-93), 61st round (2004-05) and 68th round (2011-12). All rounds are related with the Employment and Unemployment Survey in India. For employment we have considered the usual activity status (i.e., both principle status and subsidiary status) of the workers. The absolute number of workers was estimated by using Census segment-wise population (male, female, rural and urban) projections and NSSO segment-wise workers population ratio (Himanshu 2011 and Das 2012). All the rounds from the 50th to 66th are fully comparable to each other and give a long-term trend in employment for the last two decades. We also use Central Statistical Organisation (CSO) data for the State Domestic Product (SDP) during 1993-94 to 2011-12 at constant (base year 2004-05) price.

The rest of the paper is divided into four sections. Sections II discusses the trends of per capita SDP, average output per worker (i.e., labour productivity) and employment. Section III analyses the growth rates of output, employment and labour productivity as well as the nature of growth in terms of output elasticity of employment across the major states of India. Section IV deals with the nature growth in the agriculture, industry and service sectors across states of India. Section V analyses with the empirical results of the relationship among the growth rates of employment, per capita SDP and labour productivity. Finally, section V makes the concluding observations.

2. Trend of Output, Productivity and Employment across States in India

Per capita SDP can be expressed as the components of average output per worker (i.e., Labour Productivity) and worker population ratio (WPR)

SDP/P = SDP/E x E/P

Where,

SDP/P = SDP/population = per capita SDP

SDP/E = SDP/Employment = Average output per worker i.e., Labour Productivity

E/P x 100 = (Employment/Population) x 100 = WPR

Table 1 Per Capita GDP and Employment across States in India, 1993-94 to 2011-12

States	Per capita SDP(Rs)			Employment (in millions)		
	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Andhra Pradesh	15555	25432	42020	36.1	39.6	40.1
Bihar	6389	7752	12281	23.3	28.0	28.5
Chhattisgarh	16138	18385	26470	7.9	10.8	11.9
Gujarat	18946	31818	55745	19.2	24.9	25.6
Haryana	23800	38112	62753	6.5	9.0	8.8
Himachal Pradesh	18345	33274	48685	2.9	3.3	3.6
Jharkhand	15125	18225	24239	7.1	11.7	11.7
Karnataka	17047	26650	40795	22.1	27.1	26.0
Kerala	18971	33107	55208	11.4	12.4	12.7
Madhya Pradesh	13214	15427	24104	21.5	27.8	28.3
Maharashtra	24922	36097	64825	37.9	47.4	49.0
Manipur	14405	19119	23139	0.7	1.0	1.1
Meghalaya	15040	22939	32188	1.0	1.3	1.3
Orissa	12102	17569	24011	14.2	16.9	17.5
Punjab	26037	33653	48934	8.0	10.6	11.0
Rajasthan	12167	18513	28355	21.8	26.5	27.8
Tamil Nadu	18868	29378	50553	28.2	31.5	32.3
Tripura	12306	24358	38647	0.9	1.1	1.4
Uttar Pradesh	8931	12955	18242	51.2	65.2	68.1
Uttarakhand	17073	24606	49018	2.5	4.0	3.7
West Bengal	13527	22572	33310	26.5	32.2	36.2
India	15249	22795	36441	372.0	457.7	472.6

Note: SDP at Constant Price (base year 2004-05).

Source: 1. Central Statistical Organization, Government of India, www.mospi.nic.in.

2. *NSSO, Employment and Unemployment (Situation) in India, Rounds 50th, 61th and 68th.*

Per Capita SDP, employment, labour productivity and WPR across states in India are presented in Table 1 and Table 2. The per capita GDP (at constant price) of India increased from Rs.15249 in 1993-94 to Rs 36441 in 2011-2. The employment was 372.0 million in 1993-94. It increased thereafter to 457.7 million in 2004-05 and further to 472.6 million in 2011-12. During the entire period the per capita output increased at the extent of Rs. 21119 while the additional employment increased only 100.6 million in India. The employment and output increased in all states of India during this period. But the change of output and employment widely varied across states of India. The increase of per capita SDP was relatively low in Bihar but it was high in the high income states like Maharashtra, Haryana and Gujarat. The average output per worker (i.e., Labour Productivity) in India increased from Rs. 36419 in 1993-94 to Rs. 94663 in 2011-12. Labour Productivity increased in all states (except Jharkhand) in India while the WPR declined in most of the states during this period. The WPR decreased from 41.9 per cent in 1993-94 to 38.5 per cent in 2011-12.

Table 2 Average Output per Worker and WPR **across States in India, 1993-94 to 2011-12**

	Average output per worker(Rs)			WPR (in percentage)		
States	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Andhra Pradesh	29790	50862	89559	52.2	50.0	46.9
Bihar	18395	25040	45745	34.2	31.0	26.8
Chhattisgarh	35103	38484	57687	45.6	47.8	45.9
Gujarat	43206	69247	133695	43.9	45.9	41.7
Haryana	64755	95672	184651	36.8	39.8	34.0
Himachal Pradesh	34130	63673	93387	53.8	52.3	52.1
Jharkhand	45134	45527	69670	33.0	40.0	34.8
Karnataka	36244	54913	96965	47.0	48.5	42.1
Kerala	49595	84699	147233	38.3	39.1	37.5
Madhya Pradesh	29155	35982	62889	44.9	42.9	38.3
Maharashtra	55022	78057	150404	45.3	46.2	43.1

Manipur	38244	46519	63030	37.7	41.1	36.7
Meghalaya	29033	46193	73506	51.8	49.7	43.8
Orissa	28243	40293	58279	42.8	43.6	41.2
Punjab	69165	80875	124662	37.6	41.6	39.3
Rajasthan	26304	42579	71161	46.3	43.5	39.8
Tamil Nadu	38450	61408	114500	49.1	47.8	44.2
Tripura	37496	76239	102271	32.8	31.9	37.8
Uttar Pradesh	24410	35460	54370	36.5	36.5	33.6
Uttarakhand	47873	56255	136868	35.6	43.7	35.8
West Bengal	36347	59059	84819	37.2	38.2	39.3
India	36419	54502	94663	41.9	41.8	38.5

Source: As in Table 1.

Most of the states witnessed a fall in WPR in 2011-12 compared with 1993-94. Punjab, Tripura, West Bengal, Jharkhand and Uttarakhand were the exceptional where WPR increased in the subsequent years. High growth of output along with a very low growth of employment is the unique feature of the labour surplus economy like India.

3. Growth Rates of Output, Employment and Labour Productivity

The growth rate of output as well as employment widely varied across states in India (Table 3). The annual average growth rate of employment was positive in all states during 1993-94 to 2004-05. But it decreased in all states during the later period (2004-05 to 2011-12) with negative growth rate in some states like Haryana, Karnataka and Uttarakhand. The average annual growth rate of output were substantially higher than the growth rate of employment in all states and most of the states witnessed an increasing trends of growth of output.

Table 3 Annual Growth Rates of Output and Employment across States in India, 1993-94 to 2011-11.

States	Growth rate of SDP		Growth rate of Employment		OEE	
	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2004-05	2004-05 to 2011-12
Andhra Pradesh	7.9	11.2	0.9	0.2	0.1	0.02
Bihar	5.8	12.2	2.4	0.2	0.4	0.02
Chhattisgarh	4.4	9.5	3.8	1.6	0.9	0.16
Gujarat	9.8	14.1	2.7	0.4	0.3	0.03

Haryana	9.6	12.5	3.5	-0.4	0.4	-0.03
Himachal Pradesh	10.3	8.5	1.3	1.2	0.1	0.15
Jharkhand	6.0	7.6	6.5	0.0	1.1	0.003
Karnataka	7.8	10.0	2.0	-0.6	0.3	-0.06
Kerala	7.7	11.2	0.8	0.4	0.1	0.03
Madhya Pradesh	4.8	11.1	2.7	0.3	0.6	0.02
Maharashtra	7.1	14.2	2.3	0.5	0.3	0.03
Manipur	6.0	6.7	3.3	1.2	0.6	0.18
Meghalaya	9.4	9.5	2.5	0.7	0.3	0.07
Orissa	6.4	7.1	1.7	0.5	0.3	0.07
Punjab	5.0	8.5	3.0	0.5	0.6	0.06
Rajasthan	8.7	10.8	1.9	0.7	0.2	0.07
Tamil Nadu	7.2	13.0	1.1	0.3	0.2	0.03
Tripura	11.9	10.9	1.2	4.5	0.1	0.41
Uttar Pradesh	7.7	8.6	2.6	0.6	0.3	0.07
Uttarakhand	7.7	17.9	5.3	-1.1	0.7	-0.06
West Bengal	8.8	8.8	1.9	1.8	0.2	0.20
India	4.5	8.6	2.1	0.5	0.47	0.05

Source: Author's estimation.

Note: OEE = output elasticity of employment

The output elasticity of employment (OEE) is defined as the ratio of the growth rate of employment to the growth rate of output (last column in Table 3). The nature of the growth is determined by the value of OEE. On the basis of the value of OEE the nature of growths across states in India is classified in three categories – jobloss (if OEE<0), jobless (if 0< OEE <1) and more job (if OEE >1). Table 4 summaries the nature of growth of 21 major states in India. On the whole the growth is unfavorable to employment. A number of states observed a change from the 'more job' growth to the 'job less' growth or from the 'job less' growth to the 'job loss' growth. Three states, namely Haryana, Karnataka and Uttarakhand witnessed the 'job loss' growth during 2004-05 to 2011-12

The implication behind this phenomenon is the presence of non-inclusive form of growth. In other words, the high growth rate of per capita output being unsuccessful in absorbing the growing labour force. The growth rate of employment was negative for the higher growth

rate of labour productivity (Table 5) compared to the growth rate of output. Most of the states, 20 states in 1993-94 to 2004-05 and 18 states in 2004-05 to 2011-12, witnessed the job-less growth. The explanation of this scenario lies in the fact that the growth rate of output is higher than the growth rate of employment and a partial absorption of the growing labour force is only possible. The most preferable form of growth in a labour surplus economy like India is more job growth (OEE≥1) where the growth rate of output can completely absorb the growing workforce. It is depressing to view the situation of the Indian economy where one out of 21 states with the 'more job' growth during 1993-94 to 2004-05 had lost its position completely in the later sub-period (2004-05 to 2011-12).

Table 4 Nature of Growth across States in India, 1993-94 to 2011-12

Nature of Growth	1993-94 to 2004-05	2004-05 to 2011-2012
'Job Loss' Growth (EEO<0)	0	3
'Job Less' Growth (0≤EEO<1)	20	18
'MoreJob' Growth (EEO≥1)	1	0

Source: Based on Table 3

From the theoretical relationship it is evident that average output per worker (labour productivity) has played a major role to increase the employment (Figure 1). The annual average growth rate increased in most of the states during 2004-05 to 20011-12 compared to 1993-94 to 2004-05. Two states namely, Himachal Pradesh, Tripura were exception where the growth rate of labour productivity was deteriorated (Table 5). Besides, the growth rate of labour productivity numbered out than the growth rate of output in all states during 2004-05 to 20011-12. The resultant outcome was job less or job loss growth in all states of India during this period.

Table 5 Annual Growth rate of average output per worker across States in India, 1993-94 to 2011-12

States	1993-94 to 2004-05	2004-05 to 2011-12	States	1993-94 to 2004-05	2004-05 to 2011-12
Andhra Pradesh	6.4	10.9	Manipur	2.0	5.1
Bihar	3.3	11.8	Meghalaya	5.4	8.4

Chhattisgarh	1.9	7.1	Orissa	3.9	6.4
Gujarat	5.5	13.3	Punjab	1.5	7.7
Haryana	4.3	13.3	Rajasthan	5.6	9.6
Himachal Pradesh	7.9	6.7	Tamil Nadu	5.4	12.4
Jharkhand	1.1	7.6	Tripura	9.4	4.9
Karnataka	4.7	10.9	Uttar Pradesh	4.1	7.6
Kerala	6.4	10.5	Uttarakhand	1.6	20.5
Madhya Pradesh	2.1	10.7	West Bengal	5.7	6.2
Maharashtra	3.8	13.2	India	5.0	9.2

Source: Calculation based on Table 2

4. Nature of Growth by Sectors across States in India

During the post-reform period (1993-94 to 2011-12) the average annual growth rate of output by sectors across the 21 major states in India is shown in Table 6a. Among the three sectors, the growth rate of output was relatively high in the industrial and service sectors (above 7.0 per cent per annum). The growth rate of output in agriculture sector also improved in 15 states. The numbers of states with the high growth rate of output in agriculture increased from one in the first sub-period to six in the second sub-period. Most of the states experienced the medium and high growth rates in the industry sector. The growth rate of output of the service sector remained high in all states of India.

Table 6a Frequency distribution of annual growth rate of output by sector across states in India in periods 1993 to 2012

	Agriculture		Industry		Service	
	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2004-05	2004-05 to 2011-12
High(7.0 & above)	1	6	15	16	19	21
Medium (3.1 to 6.9)	7	7	6	3	2	0
Low(less 3.1)	13	8	0	2	0	0
Total States	21	21	21	21	21	21

Source: Authors' estimation.

But the growth rate of employment was deteriorated in all the states. The agriculture sector experienced the lowest employment growth in all states in India during 2004-05 to 2011-12. The growth rate of employment was most deteriorated in the service sector, the number of states with high growth rate of employment fell from 10 in the earlier sub-period to only one in the latter sub-period. The number of states with high growth rate of employment also declined in the industry sector (Table 6b).

Table 6b Frequency distribution of annual growth rate of employment by sector across states in India in periods 1993 to 2012

	Agriculture		Industry		Service	
	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2004-05	2004-05 to 2011-12
High(4.0 & above)	2	0	15	13	10	2
Medium (2.0 to 3.9)	3	0	4	7	10	10
Low(less 2.0)	16	21	2	1	1	9
Total States	21	21	21	21	21	21

Table 7 Nature of Growth by Sector across States of India, 1993-94 to 2011-12

Nature of Growth	1993-94 to 2004-05			2004-05 to 2011-2012		
	Agriculture	Industry	Service	Agriculture	Industry	Service
'Job Loss' Growth (EEO<0)	3	0	0	19	0	1
'Job Less' Growth (0≤EEO<1)	12	14	21	1	15	20
'More Job' Growth (EEO≥1)	6	7	0	1	6	0

Source: As in Table 6a and Table 6b

Out of 21 major states in India six states witnessed 'more job' growth in the agriculture sector during 1993-94 to 2004-05. In case of the industry sector seven states witnessed 'more job' growth during the same period. But during the later period (2004-05 to 2011-12) the number of states having 'more job' growth fell to one in the agriculture sector and six in the industry sector. In the agriculture sector there were as many as 19 states with job loss growth while in the service sector there were no more job growth states. The growth of the service sector was

'jobless' in nature. There was only one states having 'job loss' growth in the service sector during 20004-05 to 2011-12. In the industry sector there was no evidence of 'job loss' growth, while the number of states having 'job less' growth increased over time.

5. Empirical Analysis of Growth of Employment in Relation to Per Capita SDP and Labour Productivity

The impact of the growth rate of output and the growth rate of labour productivity on the growth rate of employment is analysed by using the Panel Data Regression Model (PDRM). The PDRM for the aggregate economy as well as for the three different sectors (agriculture, industry and service) are specified as follows:

$$GRE_{it} = \alpha_1 + \beta_1 GRP_{it} + U_{1,it} \ldots\ldots (1)$$

$$GRE_{it} = \alpha_2 + \beta_2 GRO_{it} + \gamma_1 GRP_{it} + U_{2,it} \ldots\ldots\ldots (2)$$

Where GRE=Growth of Employment, GRP=Growth of average output per worker, and GRO=growth of output.

$$GREA_{it} = \alpha_3 + \beta_3 GROA_{it} + \gamma_2 GRPAit + U_{3,it} \ldots\ldots (3)$$

Where GREA= Growth rate of employment in agriculture, GROA = Growth rate of output in agriculture, GRPA= Growth rate of average output per worker in agriculture.

$$GREI_{it} = \alpha_4 + \beta_4 GROI_{it} + \gamma_3 GRPI_{it} + U_{4,it} \ldots\ldots (4)$$

Where GREI=Growth rate of employment in industry sector, GROI = Growth rate of output in Industry sector, GRPI= Growth rate of average output per worker in Industry sector.

$$GRES_{it} = \alpha_5 + \beta_5 GROS_{it} + \gamma_4 GRPS_t + U_{5,it} \ldots\ldots (5)$$

Where GRES = Growth rate of employment in service sector, GROS=Growth rate of output in service sector, GRPS= Growth rate of average output per worker in service sector.

From equation 1 to 5, i=1 to 21 (number of states as specified in Table 3) and t=1 and 2 (time period as specified in Table 3). α, β and γ are the coefficients and Us are the specific disturbance terms in the respective equations.

Table 8 Estimation of the Panel Data Regression Model during the period 1993-94 to 2011-12

Estimated Model	R^2	*Wald* $Chi^2(1)$	*Prob>*Chi^2
1. GRE = 3.77 – 0.313 GRP*** (13.73) (-9.34)	0.673	87.32	0.000

2. GRE = 0.154 – 0.761 GRP*** + 0.737 GRO*** (0.46) (-18.84) (11.80)	0.927	578.09	0.000
3. GREA = 0.595 - 0.673 GRPA*** + 0.605 GROA*** (3.80) (-24.06) (16.29)	0.907	610.88	0.000
4. GREI = 0.511 - 1.652 GRPI*** + 1.091 GROI*** (0.855) (-13.28) (11.43)	0.818	176.38	0.000
5. GRES = 1.674 - 0.665 GRPS*** + 0.533 GROS*** (4.50) (-15.49) (10.83)	0.884	309.69	0.000

*** = 1% level Significant, * = 10% level Signification

The estimated results are presented in Table 8. They provide the proof of a significant inverse relationship between GRE and GRP (Equation 1) and significant direct relationship between GRE and GRO (Equation 2). GREA has a significant negative relationship with GRPA (Equation 3). On the other hand, it is positively related with GROA. GREI is also negatively related to GRPI and positively related with GROI and the relationships are statistically significant (Equation 4). The relationships are also same in the service sector (Equation 5). That is, the growth rate employment was inversely affected by the growth rate of average labour productivity and directly affected by the growth rate of output.

6. Conclusion

Our paper focuses on the pattern of growth output in relation to employment in the observed period of 1993-94 to 2011-12. From the study the various inferences have come to view: first, the relative rise in output is much greater than that of employment. Therefore, the scope of employment is more for trained than untrained workers. There is a sharp contrast by regions and sectors. Second, the 'jobless' growth is the nature of growth in the Indian economy. Thirdly, growth of service sector is highest among the three sectors. The percentage share of output is more in the service sector but the percentage share of employment is more in the agriculture sector. The growth of labour productivity adversely affects to the growth of employment as well as output elasticity of employment in India. In an economy like India, with large surplus labour force, importance of anemployment-oriented growth is obvious. 'Jobless' or 'Job loss', growth is not the desirable nature of growth.

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